

REMARKS

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. In response, applicant has amended the specification to include all features recited in the claims. Withdrawal of the objection is respectfully requested.

Claims 1, 3 and 4 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In response, applicant has amended claim 1 as suggest by the examiner. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 1, 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Heinen et al. (US 6,415,835) in view of Shesterkin (US 2,268,344) and further in view of Tomioka et al. (US 5,211,779) or Williams (US 4,299,264). Applicant traverses this rejection because none of the cited prior art references, taken alone or in combination, disclose or suggest that water flows in the circumferential grooves along the line portions to form a vortex flow, as recited in claim 1.

In an embodiment of the present invention, a circumferential groove extends in the tire circumferential direction of the tread surface of a tire. Line portions, composed of ridges or recesses, are provided in a wall face of the circumferential groove, and have an inclined angle of 10° to 35° with respect to the groove longitudinal direction. This inclined angle causes water that flows into the circumferential groove to more easily form vortices, which advantageously positively discharge water that enters the tire circumferential groove and help to prevent hydroplaning.

In contrast, Heinen discloses a groove that contains a series of peaks and valleys referred to as “eddy break-up devices.” The peaks and valleys are skewed with respect to a median plane that bisects the groove by an angle in the range of 45° to 90°. The Heinen reference discloses that the peaks and valleys of this invention are designed to disrupt eddies or vortices that are present along the respective groove surface by disrupting tangential flow and reverse flow regions of the eddies. Thus, the peaks and valleys disclosed in Heinen are designed to prevent the formation of vortices, and not to encourage vortex formation, as recited in claim 1.

The Shesterkin reference discloses grooves that extend circumferentially around the tire, with V-shaped ridges formed at the bases of the tread grooves. The ridges are angularly disposed relative to the circumferential path of the tread grooves, preferably at an angle on the order of 45°. The Shesterkin reference discloses that the ridges are formed to help direct cracks that form at the base of the circumferential groove, in an effort to reduce the length of the cracks. However, the Shesterkin reference is silent regarding any effect the ridges may have on water flow. That is, the Shesterkin reference does not disclose that water flows in the circumferential grooves along line portions to form a vortex flow, as recited in claim 1.

The Tomioka et al. and the Williams references are cited for disclosing lateral grooves extending from the circumferential grooves away from the circumferential center of the tread surface. However, both references are silent regarding line portions formed within a circumferential groove that cause water to form a vortex flow, as recited in claim 1. Thus,

none of the cited reference, whether taken alone or in combination, disclose or suggest that water flows in the circumferential grooves along line portions to form a vortex flow, and is discharged from the circumferential grooves, as recited by claim 1. For at least this reason, applicant respectfully requests withdrawal of the § 103 rejection of claims 1, 3 and 4.

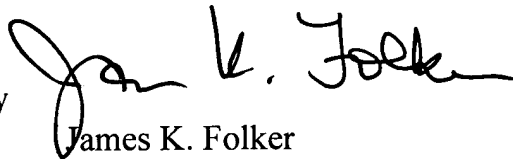
Moreover, applicant submits that there is no motivation to combine the Heinen et al. reference and the Shesterkin reference. As discussed above, the object of the Heinen reference is to increase the flow of water out of the circumferential groove and prevent hydroplaning by disrupting eddies or vortices that form along the groove surface and reduce skin friction of the groove. In contrast, the object of the Shesterkin reference is to reduce tread cracking in the region of the groove base and limit the length of tread cracking by providing corrugations at the base of the circumferential groove. Thus, because the objects of the Heinen and Shesterkin reference differ so greatly from one another, applicant does not believe that one of skill in the art would look to the Shesterkin reference to modify the teachings of the Heinen et al. reference. For this additional reason, applicant again respectfully requests withdrawal of the rejection of claims 1, 3 and 4.

New claim 6 has been added to the pending application. Applicant believes that new claim 6 is allowable for at least the reasons discussed above with respect to claim 1.

For all of the above reasons, applicant requests reconsideration and allowance of the claimed invention. The examiner should contact applicant's undersigned attorney if a telephone conference would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 
James K. Folker
Registration No. 37,538

April 1, 2008

Suite 2500
300 South Wacker Drive
Chicago, Illinois 60606
(312) 360-0080

Customer No. 24978